

CLAIMS

1 1. A vessel for observing a chemical substance, comprising:
2 a base portion;
3 an optically transmissive wall portion projecting away from the base portion,
4 the base portion and the wall portion defining an interface region at an interface between the
5 base portion and the wall portion, the base portion and the wall portion defining an exterior
6 region and an interior region, the interior region being configured to contain the chemical
7 substance and having an opening through which the chemical substance can pass; and
8 a background material having a first surface and a second surface facing
9 opposite from the first surface, the first surface of the background material being fixedly
10 attached to the base portion and/or the interface region, the first surface of the background
11 material being visible through the wall portion from the exterior region.

1 2. The vessel of claim 1 wherein the background material includes a paint
2 layer, further wherein the first surface of the background material is defined by a first surface
3 of the paint layer and the second surface of the background material is defined by the second
4 surface of the paint layer.

1 3. The vessel of claim 1 wherein the base portion and/or the interface
2 region have an inner surface defining the interior region and an outer surface defining the
3 exterior region, and further wherein the background material is disposed between the inner
4 and outer surfaces.

1 4. The vessel of claim 1 wherein the base portion, the wall portion and the
2 interface region are integrally formed with each other.

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- 1 5. The vessel of claim 1 wherein the base portion and the wall portion each
2 have an inner surface defining the interior region and an outer surface defining the exterior
3 region with the first surface of the background material disposed adjacent to the outer surface
4 of the wall portion and/or the interface region, and further wherein the vessel further
5 comprises a protective layer adjacent to the second surface of the background material.
- 1 6. The vessel of claim 1 wherein the background material has a single hue.
- 1 7. The vessel of claim 1 wherein the background material is opaque.
- 1 8. The vessel of claim 1 wherein a first portion of the background material
2 has a first hue and a second portion of the background material has a second hue different
3 than the first hue.
- 1 9. The vessel of claim 1 wherein the background material covers at least
2 part of the wall portion.
- 1 10. The vessel of claim 1 wherein at least a portion of the background
2 material is white.
- 1 11. The vessel of claim 1 wherein at least a portion of the background
2 material is black.
- 1 12. The vessel of claim 1 wherein the background material covers at least
2 approximately the entire base portion.
- 1 13. The vessel of claim 1 wherein the background material extends over at
2 least part of both the base portion and the wall portion.
- 1 14. The vessel of claim 1 wherein the background material includes a
2 flexible sheet adhesively bonded to the base portion and/or the wall portion.

1 15. The vessel of claim 1 wherein the background material includes an
2 elongated strip.

1 16. The vessel of claim 1 wherein a perimeter of the background material on
2 the wall portion has an elliptical shape.

1 17. The vessel of claim 1 wherein the base portion has a generally circular
2 shape and the wall portion has a generally conical lower portion and a generally cylindrical
3 upper portion.

1 18. A vessel for observing a chemical substance, comprising:

2 a base portion having an outer surface and an inner surface;

3 an optically transmissive wall portion projecting away from the base portion

4 and having an inner surface and an outer surface, the outer surfaces of the base portion and
5 the wall portion defining an exterior region, the inner surfaces of the base portion and the
6 wall portion defining an interior region, the interior region being configured to contain the
7 chemical substance and having an opening configured to removably receive the chemical
8 substance; and

9 a background material having a first surface and a second surface facing away
10 from the first surface, the background material being positioned between the inner and outer
11 surfaces of at least one of the base portion and the wall portion, the first surface of the
12 background material being visible through the wall portion from the exterior region.

1 19. The vessel of claim 18 wherein the background material has a single
2 hue.

1 20. The vessel of claim 18 wherein a first portion of the background
2 material has a first hue and a second portion of the background material has a second hue
3 different than the first hue.

1 21. The vessel of claim 18 wherein at least a portion of the background
2 material is white.

1 22. The vessel of claim 18 wherein the background material covers at least
2 approximately the entire base portion.

1 23. The vessel of claim 18 wherein the background material extends over at
2 least part of both the base portion and the wall portion.

1 24. The vessel of claim 18 wherein the background material includes a
2 flexible sheet adhesively bonded to the base portion and/or the wall portion.

1 25. The vessel of claim 18 wherein the background material includes an
2 elongated strip.

1 26. The vessel of claim 18 wherein the base portion has a generally circular
2 shape and the wall portion has a generally conical lower part adjacent to the base portion and
3 a generally cylindrical upper part adjacent to the lower part.

1 27. A vessel for observing chemical substances, comprising:
2 a base portion;
3 an optically transmissive wall portion projecting away from the base portion,
4 the base portion and the wall portion defining an interface region at an interface between the
5 base portion and the wall portion, the base portion and the wall portion defining an exterior
6 region and an interior region, the interior region being configured to contain the chemical
7 substance and having an opening configured to removably receive the chemical substance;
8 and
9 a background material having a first surface and a second surface facing
10 opposite from the first surface, the first surface of the background material being fixedly
11 attached to the base portion and/or the interface region, the first surface of the background
12 material further including a first colored region having a first color and a second colored

13 region having a second color different than the first color, the first surface of the background
14 material being visible through the wall portion from the exterior region.

1 28. The vessel of claim 27 wherein the base portion and/or the interface
2 region have an inner surface defining the interior region and an outer surface defining the
3 exterior region, and further wherein the background material is disposed between the inner
4 and outer surfaces.

1 29. The vessel of claim 27 wherein the background material includes a paint
2 layer, further wherein the first surface of the background material is defined by a first surface
3 of the paint layer and the second surface of the background material is defined by the second
4 surface of the paint layer.

1 30. The vessel of claim 27 wherein the first color corresponds to a first pH
2 value and the second color corresponds to a second pH value.

1 31. The vessel of claim 27 wherein the background material covers at least
2 approximately the entire base.

1 32. The vessel of claim 27 wherein the background material extends over at
2 least part of both the base portion and the wall portion.

1 33. The vessel of claim 27 wherein the background material includes a
2 flexible sheet adhesively bonded to the base portion.

1 34. The vessel of claim 27 wherein the base portion has a generally circular
2 shape and the wall portion has a generally conical lower region adjacent to the base portion
3 and a generally cylindrical upper region adjacent to the lower region.

1 35. A vessel for observing liquid chemical substances, comprising:
2 a generally circular base portion having an internal surface, an external surface
3 and a generally transparent medium between the internal and external surfaces;

4 an optically transmissive wall portion projecting away from the base portion,
5 the wall portion having a generally conical lower region and a generally cylindrical upper
6 region, the base portion and the wall portion defining an exterior region and an interior
7 region, the interior region being configured to contain the chemical substance and having an
8 opening configured to removably receive the chemical substance; and

9 an opaque white pigment layer having a first surface facing toward the base
10 portion and a second surface facing away from the first surface, the first surface of the
11 pigment layer being fixedly attached to the external surface of the base portion to cover
12 approximately the entire external surface, the first surface being visible from the exterior
13 region through the generally transparent medium of the base and through the wall portion.

1 36. The vessel of claim 35 wherein the pigment layer covers at least part of
2 the wall portion.

3 37. A method for visually monitoring a chemical substance, comprising:
4 disposing the chemical substance in a vessel that includes a base portion, a wall
5 portion extending away from the base portion and having at least one transparent region, and
6 an interface region at an interface between the wall portion and the base portion;
7 positioning the chemical substance at least proximate to a background material
8 fixedly attached to the vessel with the background material covering at least part of the base
9 portion and/or at least part of the interface region;
10 moving the vessel and the background material as a unit; and
11 viewing the chemical substance and the background material simultaneously
12 through the at least one transparent region of the wall portion.

1 38. The method of claim 37 wherein the base portion, the wall portion and
2 the interface region define an inner surface and an outer surface and the background material
3 is positioned adjacent to the outer surface, further wherein viewing the chemical substance
4 and the background material simultaneously includes viewing the background material
5 through the inner and outer surfaces.

1 39. The method of claim 37 wherein the base portion, the wall portion and
2 the interface region are formed from a medium having an inner surface and an outer surface,
3 and wherein the background material is positioned between the inner and outer surfaces,
4 further wherein viewing the chemical substance and the background material simultaneously
5 includes viewing the background material through the inner surface of the medium and
6 through a part of the medium between the inner surface and the background material.

1 40. The method of claim 37 wherein moving the vessel and the background
2 material as a unit includes grasping the vessel without separately grasping the background
3 material.

1 41. The method of claim 37 wherein viewing the chemical substance and
2 the background material simultaneously includes viewing a first hue of the background
3 material and a second hue of the background material different than the first hue.

1 42. The method of claim 37 wherein viewing the chemical substance and
2 the background material simultaneously includes viewing a white portion of the background
3 material.

1 43. The method of claim 37 wherein simultaneously viewing the chemical
2 substance and the background material includes viewing a black portion of the background
3 material.

1 44. The method of claim 37 wherein the background material covers part of
2 the base portion, and wherein the method includes viewing the chemical substance against
3 the part of the base portion.

1 45. The method of claim 37 wherein the background material extends over
2 at least a first part of the base portion and a second part of the wall portion, and wherein the
3 method further comprises viewing the chemical substance against both the first and second
4 parts.

1 46. The method of claim 37, further comprising:
2 disposing a chemical indicator in the vessel;
3 disposing a titrating substance in the vessel;
4 stirring the contents of the vessel; and
5 detecting an equivalence point of the contents of the vessel by viewing the
6 chemical substance through the vessel wall while the chemical substance is positioned
7 adjacent to the background material and determining an amount of the titrating substance
8 added to the vessel when the contents of the vessel changes from a first color to a second
9 color.

1 47. The method of claim 37 wherein viewing the chemical substance
2 includes viewing a liquid chemical substance.

1 48. The method of claim 37 wherein viewing the chemical substance
2 includes viewing a liquid portion of the chemical substance and viewing a solid precipitate of
3 the chemical substance.

1 49. A method for visually monitoring a chemical substance, comprising:
2 disposing the chemical substance in a vessel having a base portion, a wall
3 portion extending away from the base portion and having at least one transparent region, and
4 an interface region at an interface between the wall portion and the base portion;
5 positioning the chemical substance at least proximate to a background material
6 fixedly attached to the vessel with the background material covering at least part of the base
7 portion, and/or at least part of the interface region, the background material having a first
8 region with a first hue and a second region with a second hue different than the first hue;
9 moving the vessel and the background material as a unit; and
10 viewing the chemical substance and the background material simultaneously
11 through the at least one transparent portion of the wall portion while the chemical substance
12 is positioned adjacent to the first and second regions of the background material.

1 50. The method of claim 49 wherein the base portion, the wall portion and
2 the interface region are defined by a medium having an inner surface and an outer surface,
3 further wherein the background material is positioned adjacent to the outer surface of the
4 medium, still further wherein viewing the chemical substance and the background material
5 simultaneously includes viewing the background material through the inner and outer
6 surfaces of the medium.

1 51. The method of claim 49 wherein the base portion, the wall portion and
2 the interface region are defined by a medium having an inner surface and an outer surface,
3 further wherein the background material is positioned between the inner and outer surfaces,
4 still further wherein viewing the chemical substance and the background material
5 simultaneously includes viewing the background material through the inner surface and
6 through a part of the medium between the background material and the inner surface.

1 52. The method of claim 49, further comprising comparing a color of the
2 chemical substance to at least one of the first hue and the second hue.

1 53. The method of claim 49 wherein the background material includes a
2 first part extending over at least part of the wall portion and a second part extending over at
3 least part of the base portion, and wherein the method further comprises viewing the
4 chemical substance against both the first and second parts of the background material.

1 54. A method for titrating a liquid chemical substance, comprising:
2 disposing the liquid chemical substance and an indicator in a vessel having a
3 base portion and a generally transparent wall portion extending away from the base portion;
4 positioning the liquid chemical substance adjacent to an opaque background
5 material fixedly attached to the base portion with the opaque background material covering at
6 least approximately the entire base portion;
7 moving the vessel and the background material as a unit and without moving
8 the background material relative to the vessel;
9 disposing a titrating agent in the vessel;

stirring the contents of the vessel; and

detecting an equivalence point of the contents of the vessel by viewing the

12 chemical substance through the wall portion while the chemical substance is positioned

13 adjacent to the opaque background material and determining an amount of the titrating agent

14 added to the vessel when the contents of the vessel changes from a first color to a second

15 color different than the first color.

53. The method of claim 54 wherein the background material extends over a

portion of the vessel wall, and wherein the method further comprises viewing the chemical

3 substance against both the portion of the background material extending over the vessel base

4 and the portion of the background material extending over the vessel wall.

1 56. A method for forming a vessel for observing a chemical substance,
2 comprising:

3 forming a base portion of the vessel;

4 forming an at least partially transparent wall portion depending from and
5 extending away from the base portion, the base portion and the wall portion defining an
6 interface region at an interface between the base portion and the wall portion, the base
7 portion and the wall portion defining an exterior region and an interior region, the interior
8 region being configured to contain the chemical substance and having an opening configured
9 to removably receive the chemical substance; and

fixedly applying a background material to the base portion and/or to the

11 interface region, the background material having a surface visible through the wall portion

12 from the exterior region.

57. The method of claim 56, further comprising dipping the base portion

2 and/or the wall portion in a reservoir of liquid background material.

58. The method of claim 56 further comprising spraying a liquid

2 background material on the base portion and the wall portion.

1 59. The method of claim 56, further comprising integrally forming the base
2 portion and the wall portion with each other.

1 60. The method of claim 56 wherein the base portion and/or the interface
2 region have an inner surface defining the interior region and an outer surface defining the
3 exterior region, and wherein the method further comprises disposing the background material
4 between the inner and outer surfaces.

1 61. The method of claim 56 wherein the base portion and the interface
2 region have an inner surface defining the interior region and an outer surface defining the
3 exterior region, and wherein the method further comprises disposing the background material
4 adjacent to the outer surface of the base portion and/or the interface region.

1 62. The method of claim 56, further comprising disposing a protective
2 coating adjacent to the background material with the background material positioned between
3 the protective coating and a surface of at least one of the base portion and the interface
4 region.

1 63. The method of claim 56, further comprising selecting the background
2 material to have a single hue.

1 64. The method of claim 56, further comprising selecting the background
2 material to be opaque.

1 65. The method of claim 56, further comprising selecting the background
2 material to include a first portion having a first hue and a second portion having a second hue
3 different than the first hue.

1 66. The method of claim 56, further comprising selecting at least a portion
2 of the background material to be white.

1 67. The method of claim 56, further comprising selecting at least a portion
2 of the background material to be black.

1 68. The method of claim 56, further comprising covering at least
2 approximately the entire base portion with the background material.

1 69. The method of claim 56, further comprising covering at least part of
2 both the base portion and the wall portion with the background material.

1 70. The method of claim 56, further comprising adhesively bonding the
2 background material to the base portion and/or the interface region.

1 71. The method of claim 56, further comprising selecting the background
2 material to have an elongated strip shape.

1 72. The method of claim 56, further comprising selecting a perimeter of the
2 background material on the wall portion to have an elliptical shape.